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Subject: Contract No. RD-91 H-2061 25X1

Reference: (a) Your letter to dated June 15, 1958

Enclosure: (1) Report on Visit to NRL Test Site on the Passive Video Intercept Receiver (H-2061.1) 25X1

Gentlemen:

In accordance with your request of reference (a), we are forwarding to you the enclosed report for proper appraisal of its contents.

As you have indicated, this document will be destroyed by your office if it is deemed necessary.

Very truly yours,

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Industrial Division

Sales Engineer

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[redacted] G & I DIVISION 25X1

H-2061-162-GLM•57 9 March 1957

[redacted] 25X1

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Subject: Report on visit to NRL test site on the Passive Video Intercept Receiver (H-2061.1)

Persons Contacted Affiliation

[redacted] 25X1

At the telephone request of [redacted] of the 25X1
Department of Defense on 1 March 1957, I visited the NRL test site on March 4th, 5th, and 6th. I took the console for the second system with me as it had circuit modifications that improved its performance over the first console.

Upon arrival at NRL Annex, Chesapeake Beach, Md., [redacted] and his associates related the difficulties experienced 25X1
with the system. It appeared that in general several things were wrong with the system and they were as follows:

1) The alert light relays were not functioning properly. They were sticking and malfunctioning in general.

2) When a radar signal was received on any band, it appeared on the headset on each of the other seven bands.

3) There was insufficient deflection on some bands when using the calibrator, which made calibration either difficult or impossible.

It was decided therefore, to remove the system number one console and place the modified console into service. This was done and the system calibration procedure was attempted. Sufficient deflection was obtained on all bands to properly adjust the alert light sensitivity controls with the exception of bands 6 and 8.

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[redacted]

After the run a further investigation of the calibration system was undertaken. From this investigation it appears that at the band 8 frequency range (20-40 KMC) the energy level of the calibrator pulse is too small for the deflection amplifier. In the other bands the attenuation of the R.F. pulse from the calibrator varies from channel to channel. This is particularly pronounced in the higher bands where cable bends attenuate the energy considerably. No immediate solution to this problem of unequal channel R.F. energy was arrived at.

As a result of the findings outlined in the preceding paragraph, [redacted] decided that at least some means should be provided to balance the channels from the pre-amps on. By applying a portion of the 5KC sine wave that is generated in the high voltage power supply to the input of the deflection amplifier and combining amplifier (common input) a deflection was obtained.

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It was then possible to adjust the balance pots for equal deflection on all eight bands.

Wednesday a test run was scheduled with radar on bands 3, 4, 5, 6, 7, and 8. The purpose of this run was to determine D.F. accuracy, band determination capabilities, and the alert light operation. The results of this test were as follows:

1) Tape recordings were taken at the headset phone jack. Well defined signals were recorded on the six bands.

2) Bands 4 and 5 gave excellent D.F. bearings throughout the test.

3) Band 8 had a deflection at the beginning of the run, but received activity ceased after 15 minutes. (It had not been established at the time of my departure whether or not the radar on band 8 had failed. The craft was so close to the radar site that exact band determination was too difficult to establish. The audio signal from the radar appeared to be getting through on more than its particular band).

4) Bands 3, 6, and 7 showed no deflection during the test. The audio signals on these bands indicated a fast scan time. An inherent time delay in displaying a trace after pulse reception was known from previous field tests with this equipment. This delay is apparently large enough so that with a fast scan time and a narrow beam pulse an insufficient number of pulses are received which in turn are incapable of producing a deflection. It should be mentioned here that the problem of scan time evidently had not been considered in the deflection amplifier design.

At the conclusion of Wednesday's run [redacted] again emphasized the fact that certain actions must be accomplished by the system in order that it fulfill the mission it is intended to do. These are: 25X1

1) The alert light and buzzer must function properly so as to warn the operator of activity in order that he may turn the tape recorder on.

2) Relative direction of radar source must be determined by means of deflection on the cathode ray tubes.

3) Band activity determination is of considerable importance for recording purposes.

With these three points in mind, I believe two modifications to the equipment are essential in order that the system may reliably perform the operational functions necessary to produce the required information.

1) The time constant of the pulse stretching network in the deflection amplifier must be reduced so that when narrow beamfast scan radars are encountered a deflection is produced and the alert light comes on.

2) Since band determination is of more importance than channel determination for recording purposes, the tape recorder will be connected to the audio output of the combining amplifier. Some means such as pot must be furnished to balance the individual combining amplifiers output when using a test signal.

In addition to the above recommendations, the following are made in order that the calibration system may be of more value than it is at present.

1) Provide an audio amplifier from the 5KC oscillator which would allow full deflection when the video cables are connected. This test signal would provide the means whereby the deflection and audio channels in the console could be balanced.

2) Move the calibrator power supply from its present location in the console and place it in the antenna. This would permit running only the -12.5 volts in the cable between antenna and console and thus eliminate the 450 cycle pickup in the console. (All attempts to date to filter this interference have failed.)

3) Consider increasing the frequency of the driving voltage for the calibrator from 450 cycles to 1000 cycles/sec. This would increase the duty cycle of the R.F. pulse in the calibrator which in turn would produce larger deflections when calibrating.

4) Attempt to take the sharp bends out of the calibrator feed cables which would reduce the attenuation and more nearly balance the energy going to the four channels.

[redacted] 25X1

CC: [redacted] 25X1

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